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| A close up of a sign  Description automatically generated | **World Radiocommunication Conference (WRC-23) Dubai, 20 November - 15 December 2023** | |  |
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| PLENARY MEETING | | **Addendum 12 to Document 149-E** | |
|  | | **30 October 2023** | |
|  | | **Original: English** | |
|  | | | |
| Thailand | | | |
| Proposals for the work of the conference | | | |
|  | | | |
| Agenda item 1.12 | | | |

1.12 to conduct, and complete in time for WRC‑23, studies for a possible new secondary allocation to the Earth exploration-satellite service (active) for spaceborne radar sounders within the range of frequencies around 45 MHz, taking into account the protection of incumbent services, including in adjacent bands, in accordance with Resolution **656 (Rev.WRC‑19)**;

Introduction:

Thailand proposes the regulatory method based on elements in the options of Method A1 from the CPM Report for this agenda item.

Thailand supports possible operational limitations for EESS (active) spaceborne radar sounders in the frequency band 40-50 MHz such as coverage areas, operation time limit as well as establishment of pfd limits to protect in-band and adjacent band incumbent services and not adversely affect those services while also considering the feasibility of spaceborne radar sounders operation.

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations  
(See No. 2.1)

MOD THA/149A12/1#1801

27.5-40.98 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 39.986-40  FIXED  MOBILE  Space research |  | 39.986-40  FIXED  MOBILE  RADIOLOCATION 5.132A  Space research |
| 40-40.02  FIXED  MOBILE  Earth exploration-satellite (active) ADD 5.A112  Space research | | 40-40.02  FIXED  MOBILE  Earth exploration-satellite (active) ADD 5.A112  Space research |
| 40.02-40.98 FIXED  MOBILE  Earth exploration-satellite (active) ADD 5.A112  5.150 | | |

MOD THA/149A12/2#1802

40.98-47 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 40.98-41.015 FIXED  MOBILE  Earth exploration-satellite (active) ADD 5.A112  Space research  5.160 5.161 | | |
| 41.015-42 FIXED  MOBILE  Earth exploration-satellite (active) ADD 5.A112  5.160 5.161 5.161A | | |
| 42-42.5  FIXED  MOBILE  Earth exploration-satellite (active) ADD 5.A112  Radiolocation 5.132A | 42-42.5  FIXED  MOBILE  Earth exploration-satellite (active) ADD 5.A112 |  |
| 5.160 5.161B | 5.161 |  |
| 42.5-44 FIXED  MOBILE  Earth exploration-satellite (active) ADD 5.A112  5.160 5.161 5.161A | | |
| 44-47 FIXED  MOBILE  Earth exploration-satellite (active) ADD 5.A112  5.162 5.162A | | |

MOD THA/149A12/3#1803

47-75.2 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 47-50  BROADCASTING  Earth exploration-satellite (active) ADD 5.A112  5.162A 5.163 5.164 5.165 | 47-50  FIXED  MOBILE  Earth exploration-satellite (active) ADD 5.A112 | 47-50  FIXED  MOBILE  BROADCASTING  Earth exploration-satellite (active) ADD 5.A112  5.162A |

ADD THA/149A12/4#1804

5.A112-A1 The use of the frequency band 40-50 MHz by the Earth exploration-satellite service (active) shall be in accordance with Resolution **[A112‑METHOD‑A1] (WRC‑23)**.

The provisions of this footnote in no way diminish the obligation of the Earth exploration-satellite service (active) to operate as a secondary service in accordance with Nos. **5.29** and **5.30**.     (WRC‑23)

ADD THA/149A12/5#1805

Draft New Resolution [A112-METHOD-A1] (WRC‑23)

Use of the frequency range 40-50 MHz allocated to the Earth exploration-satellite service (active) for spaceborne radar sounders

The World Radiocommunication Conference (Dubai, 2023),

considering

*a)* that spaceborne active sensors operating in the Earth exploration-satellite service (EESS) (active), described in Recommendation ITU‑R RS.2042‑1, can provide unique information on the physical properties of the Earth, such as characteristics of polar ice sheets and subterranean fossil aquifers in desertic environments;

*b)* that spaceborne active remote sensing requires specific frequency ranges depending on the physical phenomena to be observed;

*c)* that worldwide, periodic measurements of subsurface water/ice deposits require the use of spaceborne radar sounder active sensors;

*d)* that the measurement of reflectivity from subsurface scattering layers as deep as 10 m to 100 m for shallow aquifers and groundwater conduits, and on the order of 5 km for basal interface topography and ice-sheet thickness, is necessary;

*e)* that spaceborne radar sounders operating in the EESS (active) are intended to be operated from polar orbits, only in either uninhabited, sparsely populated or remote areas of the globe, with particular focus on deserts and polar ice fields;

*f)* that the 40-50 MHz frequency range is preferable to satisfy all operational requirements for such spaceborne radar sounder active sensors,

recognizing

*a)* that, given the complexity of the EESS (active) instruments implementation in these low frequencies, very few such platforms are expected to be in orbit at the same time; consequently, aggregate interference from multiple spaceborne radar sounders into incumbent services is not anticipated and could be mitigated by coordination between the operators of such instruments;

*b)* that measurements by these radar sounders are only possible when the total electron content of the ionosphere is near its daily minimum, which normally occurs in a few hours’ window centred approximately at 4 a.m. local time;

*c)* that No. **21.16.8** provides the equation to determine mean pfd values for EESS (active);

Note: *recognizing* *c)* does not apply to Option 2.

*d)* that coordination between operators of EESS (active) systems and operators of wind profiler radars in the frequency band 40-50 MHz may be needed on a case-by-case basis to ensure coexistence between the corresponding stations,

resolves

1 that the use of the frequency band 40-50 MHz by EESS (active) is limited to spaceborne radar sounders as described in Recommendation ITU‑R RS.2042;

2 that the following conditions shall apply to stations operating in the EESS (active) in the frequency band 40-50 MHz on a secondary basis:

2.1 not claim protection from stations operating in the radiolocation service in the frequency bands 42-42.5 MHz or 46-50 MHz. No. **5.43A** does not apply;

2.2 not claim protection from stations operating in the space research service in the frequency bands 40-40.02 MHz or 40.98-41.015 MHz. No. **5.43A** does not apply;

3 that, for the purpose of protecting the in-band and adjacent-band services, the pfd level per spaceborne radar sounder produced at the surface of the Earth in the following areas shall be as follows:

3.1 when the subsatellite[[1]](#footnote-1)1 point is located within any of the following areas:

*a)* the spherical cap formed by latitudes between 72 and 90 degrees North;

*b)* the spherical cap formed by latitudes between 60 and 90 degrees South;

*c)* the quadrangle formed by latitudes between 59 and 72 degrees North and longitudes between 25 and 55 degrees West;

the pfd level per spaceborne radar sounder produced at the surface of the Earth shall not exceed [TBD] for more than [TBD] of time, developed for clear-sky conditions;

3.2 when the subsatellite[[2]](#footnote-2)1 point is located within areas outside of those provided in *resolves*3.1, the pfd level per spaceborne radar sounder produced at the surface of the Earth shall not exceed [TBD] without prior agreement of affected administrations;

4 that, if more than one system is in operation, administrations shall ensure collectively that the limits in *resolves*3 are not exceeded and shall have consultations accordingly;

5 that the spaceborne radar sounder systems in the frequency range 40-50 MHz should only operate in a few hours’ window centred approximately at 4 a.m. local time.

invites the ITU Radiocommunication Sector

to regularly review the number and characteristics of spaceborne radar sounders and the application of *resolves*4 by concerned Member States.

**Reasons:** Thailand proposes the regulatory method based on elements in the options of Method A1 from the CPM Report for this agenda item.

SUP THA/149A12/6#1814

RESOLUTION 656 (REV.WRC-19)

Possible secondary allocation to the Earth exploration-satellite service (active) for spaceborne radar sounders in the range of frequencies around 45 MHz

**Reasons:** This resolution is no longer necessary.

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1. 1 The subsatellite point is defined as the location of the projection of the satellite’s nadir-pointing vector onto the Earth’s surface. [↑](#footnote-ref-1)
2. [↑](#footnote-ref-2)